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Supplemental Appeal Brief

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**EVIDENCE APPENDIX**

- 1) New Collegiate Dictionary, page 1077.
- 2) Envirotech Corp. v. Al George, Inc. et al. 221 USPQ 473  
(CAFC 1984)

**RELATED PROCEEDINGS APPENDIX**

**None**

# New Collegiate Dictionary

*A Merriam-Webster®*

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Springfield, Massachusetts, U.S.A.

## sibilant ◊ sidehill

sibilant \sib-ə-lənt\ adj [L. *sibilans*, *sibilans* pp. of *sibilare* to hiss, whistle, of Latin origin; having, containing, or producing the sound of or a sound resembling that of the *s* or the *sh* in such < ~ effervescent < ~ snake> — *sibilantly* adv

sibilant n : a sibilant speech sound [as English *ʃ*, *ʒ*, *ʃh*, *ʒh*, *tʃ*, *tʃh* = *tch*, or *v* = *dzh*)

sibilate \sib-ə-lāt\ v : let-out; dating [L. *sibilans*, pp. of *sibilare*] n 1 : hiss 2 : to utter an initial sibilant; prefix an *s*-sound ~ *s*-sound to ~ sibilant *sib-ə-lāt* *sib-ə-lāt* n

sibling \sib-ə-lɪŋ\ n : sib 2: sib : one of two or more individuals having one common parent

sibling species n : one of two or more species that are nearly indistinguishable morphologically

sibyl \sib-ə-lɪəl\ n : after *cup* [ME *sibylle*, *sibylle*, fr. MF & L: MF *sibylle*, fr. L *sibylle*, fr. Grk.] 1 : any of several prophetesses usu. accepted as 10 in number and credited to widely separate parts of the ancient world (as Babylonia, Egypt, Greece, and Italy) 2: a female prophet 3: FORTUNE-TELLER — *sibyllic* or *sibyllic* *sib-ə-lɪk\ adj* — *sibyllic* *sib-ə-lɪk\ adj*

sick \sik\ chiefly Scow or such 1: ill; not well: *sick* 2: ailing or sick *sick* 3: ailed or sicked *sick*: ailing or sickening [alter. of seek] 1: CHASE, ATTACK — *un* used as an imperative esp. to a dog < ~ em> 2: to incite or urge to an attack, pursuit, or harassment: *SET* *sick* *sik\ adj* [L. *sic*, thus — more at *so*] 1: intentionally so, written — used after a printed word or passage to indicate that it is intended exactly as printed or to indicate that it exactly reproduces an original (could be *sic* or *it is all*)

sic-cative \sik-sə-tiv\ n [LL *secutus* making dry, fr. L *secare*, pp. of *secare* to dry, fr. *secus* dry — more at *sact*] 1: DRIER 2: *sick* *sik\ adj* [ME *sik*, fr. OE *sic*; skin to OHG *sik* sick, Mir sochi depression] 1: (1): affected with disease or ill health: *sick* (2): of, relating to, or intended for use in sickness < ~ pay> < ~ ward> 2: *QUEASY*, *NAUSEATED* < ~ in one's stomach> (was ~ in the car) 3: undergoing menstruation 2: spiritually or morally unsound or corrupt 3: tickened by strong emotion (as shame or fear) < ~ with fear> < ~ worried> 4: b: having a strong distaste from oneself: *SATIATED* < ~ of flattery> 5: c: filled with disgust or chagrin < ~ palp that makes one ~> 6: depressed and longing for something < ~ for one's home> 4: a: mentally or emotionally unsound or disordered: *morose* < ~ thoughts> 7: b: *NACARIE*, *SADISTIC* < ~ joked> 8: lacking vigor: *SICKLY*: as: a badly encrusted *crooked* ~ in the context 9: b: declining or inactive after a period of speculative activity < grain futures were ~> 10: c: incapable of yielding a profitable crop: *crop*, *because of* buildup of disease organisms < *clover-sick soils*>

sick and tired adj: thoroughly fatigued or bored

sick bay n : a compartment in a ship used as a dispensary or hospital: *hospitally* 1: a place for the care of the sick or injured: *hospital* 2: a bed upon which one lies sick

sick call n 1: a usu. daily formation at which individuals report as sick to the medical officer 2: the period during which sick call is held

sick-en \sik-ən\ v: sickened; sick-en-ing \sik-ə-niŋ\ n 1: to make sick 2: to cause revulsion in as a result of weariness or sainly ~ n 1: to become sick 2: to become weary or fatigued

sick-en-er \sik-ə-nər\ adj: something that sickens, disgusts, or overwhelms

sick-en-ing \sik-ə-niŋ\ adj: causing sickness: *NAUSEATING* < ~ odor> — *sick-en-ing* \sik-ə-niŋ\ adj

sick-er \sik-ər\ adj [ME *siker*, fr. OE *sicor*; skin to OHG *sikor* secure; both fr. a prehistoric WGmc word borrowed fr. L *securus* secure] chiefly Scow: *SECURE*, *SAFE*; *also*: *DEFENDABLE* — *sicker* *sik-ər\ adj*

sick-er-ly \sik-ə-ler\ adv: chiefly Scow: in a secure manner: *SAFELY*

sick headache n : *MIGRAINE*

sick-ish \sik-ə-sh\ adj 1: *achroic*; somewhat ill: *SICKLY* 2: somewhat nauseated: *QUEASY* 3: somewhat sickening < ~ odor> — *sick-ishly* adv — *sick-ish-ness* n

sickle \sik-əl\ n [ME *sikel*, fr. OE *sicel* skin to OHG *sikila* sickle; both fr. a prehistoric WGmc word borrowed fr. L *sicula* sickle] 1: an agricultural implement consisting of a curved metal blade with a short handle fitted on a tang: *the cutting mechanism (as of a scythe, combine, or mower)* consisting of a bar with series of cutting elements 2: *cop* 3: a group of six stars in the constellation *Leo*

sickle adj: having the form of a sickle blade: having a curve similar to that of a sickle blade < the ~ moon>

sickle to sickle: sickle < ~ n> 1: to mow or reap with a sickle 2: to form (a red blood cell) into a crescent ~: to form into a crescent < the ability of red blood cells to ~>

sick leave n 1: an absence from work permitted because of illness 2: the number of days per year for which an employer agrees to pay employees who are sick

sickle-bill \sik-ə-bil\ n : any of various birds (as a curlew or thrasher) with a strongly curved bill

sickle cell n : an abnormal red blood cell of crescent shape

sickle-cell anemia n : a chronic inherited anemia in which a large proportion or the majority of the red blood cells tend to sickle which occurs primarily in individuals of Negro ancestry, and which is held to result from homozygosity for a semi-dominant gene

sickle-cell trait n : an inherited blood condition in which some red blood cells tend to sickle but usu. not enough to produce anemia, which occurs primarily in individuals of Negro ancestry, and which is held to result from heterozygosity for a semi-dominant gene — called also *sickleid*

sickle feather n : one of the long curved tail feathers of a cock — see *cock* illustration

sickle-leaf \sik-ə-lef\ n [NL, fr. E *sickle* (*celi*) + NL *-zonia*] : *SICKLE-CELL TRAIT*

sickle-cell trait adj 1: somewhat unwell; also: habitually ailing 2: produced by or associated with sickness < ~ complexion> < ~ appetite> 3: producing or tending to produce disease: *UN-*

WHOLESMORE < ~ climate> 4: appearing as if sick: a: LAN-  
CIAL, PALE < ~ face> b: WRETCHED, UNBASY < ~ smile>

c: lacking in vigor: *WEAK* < ~ place> < ~ beer> 5: a: tending to produce nausea < ~ odor> b: MAWISH —

sickliness n — sickly sick-ly: sick-ly: to make sick or sickly

sick-ness \sik-nes\ n 1: ill health: *ILLNESS* b: a disordered, weakened, or unsound condition (as of society or a particular institution) 2: a specific disease 3: NAUSEA, OUTSIDERS

sick pay n : salary or wages paid to an employee while on sick leave

sickroom \sik-ruм, -ruм\ n : a room in which a person is confined by sickness

sick-pas-sim \sik-pas-sim, tek-pas-sim\ adv [L]: so throughout — used of a word or idea to be found throughout a book or a writer's work

siddur \sik-dər, -dər\ n, pl *siddurim* \sik-dər-əm\ [MHeb *siddur*, lit. order, arrangement]: a Jewish prayer book containing both Hebrew and Aramaic prayers used in the Ashkenazic daily liturgy

side \sīd\ n [ME, fr. OE *side*; akin to OHG *sīd* side, OE *sīd* simple, wide, open to see — more at *sow*] 1: a: the right or left part of the wall or trunk of the body < pain in the > b (1): one of the halves of the animal body on either side of the median plane (2): a cut of meat including that about the ribs of one half of the body — used chiefly of smoked pork products c: one longitudinal half of a hide 2: a: a place, space, or direction with respect to a center or to a line of division (as of an aisle, river, or street) 3: a surface forming a border or face of an object 4: a: an outer portion of something considered as facing in a particular direction < the upper ~ of a sphere> 5: a: a slope or declivity of a hill or ridge 6: a: a bounding line of a geometrical figure < each ~ of a square> b: one of the surfaces that delimit a solid: esp. ~ one of the longer surfaces c: either surface of a thin object < one ~ of a record> 7: a: the space beside one < she never left her ~> 8: a: the attitude or activity of one person or group with respect to another: *PART* 9: a body of partisans or contestants *victory* for neither > 10: a: line of descent traced through one's parent < grandfather on his mother's side > 11: a: aspect or part of something viewed as contrasted with some other aspect or part < the better ~ of his nature> 12: a position assumed as opposite to or contrasted with another < two ~ to every question> 13: Brit: sideways spin imparted to a billiard ball 14: a sheet containing the lines and cuts for a single theatrical role *see* — on the side 1: in addition to the main portion 2: in addition to principal occupation

side adj 1: a: of or relating to the side b: situated on the side < ~ window> 2: a: directed toward or from the side < ~ thrust> b: *INCIDENTAL*, *INDIRECT* < ~ issue> < ~ remark> c: made on the side < ~ payment> 4: additional to the main portion < ~ order of church fine>

side-by-side adj: *sidling* p: 1: to agree with: *support* 2: to be side by side with 3: 1: to set or put aside: *clear away* < ~ dishes> 4: to furnish with sides or siding < ~ a house> ~ n: to take sides: *join* or form sides < *sided with the rebels*>

side n [obs. E side (ground, boastful)] : swaggering or arrogant manner: *PRETENTIOUSNESS*

side-arm \sik-dərm\ adj: of, relating to, or constituting a baseball pitching style in which the arm is not raised above the shoulder and the ball is thrown with a sideways sweep of the arm between shoulder and hip < ~ delivery> — *sideward* \sik-dərd\ adj

side arm n : a weapon (as a sword, revolver, or bayonet) worn at the side or in the belt

side-band \sik-bänd\ n : the band of frequencies (as of radio waves) on either side of the carrier frequency produced by modulation

side bearing n : the space provided at each side of a typeset letter to prevent its touching adjoining letters

side-board \sik-börd\, -börd\ n : a piece of dining-room furniture having compartments and shelves for holding articles of table service

side-burns \sik-bərnz\ n, pl [a diagram of *burnsides*] 1: smooth whisker cap: short side-whiskers worn with a smooth chin 2: continuations of the hairline in front of the ears — *side-burned* \sik-bərn̄d\ adj

side by side adv 1: beside one another < walked side by side down the aisle> 2: in the same place, time, or circumstance < lived peacefully side by side for many years> — *side-by-side* adj

side-car \sik-kär\ n 1: a car attached to a motorcycle for a passenger seated abreast of the cyclist 2: a cocktail consisting of a liqueur with lemon juice and brandy

side-dish n : one of the foods subordinate to the main course

side-dress \sik-dres\ n 1: plant nutrients used to side-dress a crop 2: the art or process of side-dressing a crop

side-dress v: to place plant nutrients on or in the soil near the root of a growing crop often by means of a cultivator having a fertilizer-distributing attachment

side-dressing: *SIDEDRESS*

side drum n : *SNARE DRUM*

side effect n : a secondary and usu. adverse effect (as of a drug) < toxic side effect> — called also *side reaction*

side-glance \sik-glaңs\ n 1: a glance directed to the side 2: a passing allusion: an indirect or slight reference

side-hill \sik-hil\ n : *HILLSIDE*

a shot \* kitten or further a buck a bale a cart, cart ad out to chin a less & easy a gift a trip I lift I joke a sing & now a few a coin in thin in this a foot a foot y yet y few y few y furious zh vision

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**FULL TEXT OF CASES (USPQ FIRST SERIES)****Envirotech Corporation v. Al George, Incorporated et al, 221 USPQ 473 (CA FC 1984)**

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Envirotech Corporation v. Al George, Incorporated et al, 221 USPQ 473 (CA FC 1984)

**Envirotech Corporation v. Al George, Incorporated et al**

**(CA FC)**  
**221 USPQ 473**

Decided Mar. 19, 1984

No. 83-1107

U.S. Court of Appeals Federal Circuit

**Headnotes****PATENTS****1. Infringement -- Law or fact question (§ 39.60)****Infringement -- Tests of -- Comparison with claim (§ 39.803)**

Finding of infringement depends on whether accused device falls within scope of asserted claims as properly interpreted; patented invention as indicated by language of claims must first be defined -- question of law -- and then trier must judge whether claims cover accused device -- question of fact.

**2. Pleading and practice in courts -- Burden of proof -- Infringement (§ 53.134)**

Patent owner must show by preponderance of evidence that accused has infringed his patent.

**3. Court of Appeals for the Federal Circuit -- Weight given decision reviewed (§ 26.57)****Pleading and practice in courts -- Motions -- In general (§ 53.631)**

Judge on JNOV motion in patent infringement suit -- and CAFC on review -- must ascertain whether there was substantial evidence of such quality and weight that reasonable and fair-minded men in exercise of impartial judgment could reasonably return verdict for non-moving party.

**4. Construction of specification and claims -- Claim defines invention (§ 22.30)****Infringement -- Tests of -- Comparison with claim (§ 39.803)**

Resort must be had in first instance to words of claim which define metes and bounds of invention; if

accused matter falls clearly within terms of claim, infringement is normally made out; said another way, what is patented must first be defined.

**5. Construction of specification and claims -- Defining (§ 22.45)**

Words in claim will be given their ordinary and accustomed meaning unless it appears that inventor used them differently.

**6. Pleading and practice in courts -- Jury trial -- Validity and infringement (§ 53.577)**

It was up to jury to determine whether portion of accused device is in fact functional.

**7. Infringement -- Law or fact question (§ 39.60)**

Whether defendants infringed claims of patent is factual issue.

**8. Construction of specification and claims -- By specification and drawings -- In general (§ 22.251)**

Terms of claims are best construed in light of specification and circumstances that surround patent at its inception.

**9. Courts of Appeals -- Weight given findings of District Court -- Validity and infringement (§ 29.359)**

**Infringement -- Law or fact question (§ 39.60)**

**Infringement -- Substitution of equivalents (§ 39.751)**

Accused device may infringe if it performs substantially same function in substantially same way to obtain same result as claimed apparatus; finding of equivalence is determination of fact that may be based on proof by testimony of experts, and should be disturbed only as allowed by general principles governing appellate review.

**10. Jurisdiction of courts -- Declaratory judgment -- Actual controversy (§ 43.303)**

Although CAFC affirmance of judgment of non-infringement may render academic, validity of patents at issue, if defendants on remand seek to continue with their claim of invalidity, court below and parties will have to face problems whether constitutional "case or controversy" still exists between present parties, and if it does, whether it is appropriate to issue declaratory judgment.

**11. Pleading and practice in courts -- Jury trial -- In general (§ 53.571)**

**Presumption from patent grant -- Patent Office consideration of prior art (§ 55.5)**

Instruction that "as to information or documents (prior art) which you find from file wrapper to not have been considered by the examiner and which you find to teach an invention closer to or more like that claimed \* \* \* no such presumption (of validity) exists," is improper; presumption does not change upon introduction of that art, or at any other time; it is upon introduction of more relevant art that challenger's burden of persuasion may be more easily carried.

**12. Patentability -- Utility (§ 51.75)**

Fact that invention has only limited utility and is only operable in certain applications is not grounds for finding lack of utility; some degree of utility is sufficient for patentability; further, defense of non-utility cannot be sustained without proof of total incapacity.

**13. Pleading and practice in courts -- Jury trial -- In general (§ 53.571)**

Submission of obviousness question to jury should preferably be accompanied by specified "interrogatories" designed to elicit responses to all factual inquiries enumerated in *Graham v. John Deere Co.*, 148 USPQ 459; proper instructions based on those inquiries should always be given; "interrogatory" is inapt instruction that reads, "Do you find that defendants have proved by clear and convincing evidence that the differences between the patent claims and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains;" jury's answer -- "Was obvious" -- is type of special verdict on issue of obviousness.

**14. Court of Appeals for the Federal Circuit -- Pleading and practice (§ 26.57)**

CAFC must be satisfied that party challenging validity of patent has properly carried its burden of overcoming presumption of validity; absent such satisfaction, CAFC merely vacates and remands on issue of validity, since court never "declares" patent valid; CAFC leaves initially to district court extent to which new trial is required if issue of patent invalidity is pursued on remand.

**Particular patents -- Flotation Processes and Devices**

4,110,210, Degner and Colbert, Dispersed Gas Flotation Process, holding of noninfringement of claims 1, 14, and 15, affirmed; holding of invalidity vacated.

4,226,706, Degner and Colbert, Dispersed Air Flotation Machine, holding of noninfringement of claims 1, 10, 11 and 12, affirmed; holding of invalidity vacated.

**Case History and Disposition:**

Appeal from District Court for the Western District of Louisiana.

Action by Envirotech Corporation, against Al George, Incorporated, and Monosep, Inc., for patent infringement, in which defendants counterclaim for declaration of patent invalidity and noninfringement. From judgment for defendants, plaintiff appeals. Affirmed in part, vacated in part, and remanded; Baldwin, Circuit Judge, specially concurring, with opinion.

**Attorneys:**

V. Bryan Medlock, Jr., Dallas, Tex., for appellant.

H. Coke Wilson, Houston, Tex. (Thomas Marsteller, Houston, Tex., of counsel) for appellee.

**Judge:**

Before Davis, Baldwin and Kashiwa, Circuit Judges.

**Opinion Text**

**Opinion By:**

Davis, Circuit Judge.

Envirotech Corporation (Envirotech) appeals from a judgment, after a jury trial, of the United States District Court for the Western District of Louisiana holding that claims 1, 14 and 15 of its U.S. Patent 4,110,210 ('210) ("Dispersed Gas Flotation Process") and claims 1, 10, 11 and 12 of its U.S. Patent 4,226,706 ('706) ("Dispersed Air Flotation Machine") are invalid and not infringed by appellees Al George, Incorporated and Monosep, Inc. (Monosep). We affirm in part, and vacate and remand in part.

**Background**

**A. The General Technology**

The Envirotech patents involve separation of materials having different densities by ejecting minute gas bubbles into a tank containing a two-component fluid or solid/fluid "slurry." The bubbles attach to the particles to be separated and provide sufficient buoyancy so that both particle and bubble float to the tank surface to form a froth that is skimmed from the surface — thus, the term "flotation separation." Typical flotation separation devices use a nozzle extending beneath the tank's surface in order to introduce bubbles into the tank by ejecting a mixture of air and water as a two-phase (gas and liquid) effluent.

In order to have successful flotation separation, two principal conditions must exist. First, the surface of the liquid in the tank must be relatively smooth because turbulence will dislodge the particles from their bubbles

causing them to sink back into the fluid. Second, the bubbles must be dispersed throughout the tank in order to come into contact with all of the particles to be separated. In the past, dispersion was achieved by using various types of impellers placed at the bottom of the tank, using multiple nozzles in each tank, or using baffles.

### **B. The Method of the '210 Patent**

The '210 patent discloses a flotation separation method in which a two-phase effluent is ejected from a single nozzle into a tank in such a fashion that the desired conditions of good bubble distribution and a smooth non-turbulent surface may be obtained throughout a range of tank sizes without the use of baffles, impellers or multiple nozzles. The invention recognized that one could obtain these optimal conditions with a certain effluent density (gas-liquid ratio) and a certain energy rate per tank volume (velocity of the effluent). Figure 2 of the '210 patent graphically illustrates this energy/density relationship for a wide range of tank sizes:

*Tabular, graphic, or textual material set at this point is not available. Please consult hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

The curves set forth in Fig. 2, *supra*, divide the graph into Regions I, II and III. If a nozzle and tank combination are designed to operate within Region I then the two conditions for optimal separation can be obtained. Operation within Region III lacks these two conditions, and Region II is a gray area. Claim 1 of the '210 patent is representative:

1. A dispersed gas flotation process wherein hydraulic effects are used to disperse gas bubbles throughout a contained liquid body with a free surface, said process comprising pumping a two-phase fluid into the liquid body through an ejection device with the density and the kinetic energy rate of the ejected fluid per unit volume of the contained body at the point of ejection being defined by a point on the graph of FIG. 2 within the area encompassed by Region 1.

According to the teachings of the patent, to calculate effluent density the designer need know only the flow rate of gas through the nozzle ( $Q_G$ ) and the flow rate of the liquid through the nozzle ( $Q_L$ ). To calculate the effluent energy rate per tank volume, the designer must know the tank volume ( $V$ ), the flow rate of the gas through the nozzle ( $Q_G$ ), the flow rate of the liquid through the nozzle ( $Q_L$ ), and the area of the effluent being ejected into the tank at the "point of ejection" ( $A_e$ ).

### **C. The Apparatus of the '706 Patent**

The '706 patent discloses a flotation separator having a series of tanks arranged in line so that the contaminated fluid can be treated in stages from one tank to another. As shown in Figure 2 of the '706 patent, reproduced below, each flotation tank 13 has one nozzle 20 (extending below the surface of the liquid) which ejects the two-phase effluent. The froth, which is subsequently formed by the bubble-carrying particles, is then skimmed off by paddle wheels 14, 14a.

*Tabular, graphic, or textual material set at this point is not available. Please consult hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

The claims of the '706 patent require that each nozzle have a "hollow tubular expansion chamber member" through which the two-phase effluent is discharged. The claimed pipe-within-a-pipe configuration comprises a smaller inner pipe which carries the liquid into a larger outer pipe creating a vacuum which sucks air down the outer pipe into the expansion chamber where it is mixed with the liquid from the inner pipe. The '706 patent expressly incorporates in the specification the types of "converging-diverging" nozzles included in the '210 patent. (Column 4, lines 31-33.)

### **D. The Defendants' Alleged Infringing Device**

The defendants' accused device, marketed under the name "Multisep", has a series of tanks, each having a single off-the-shelf nozzle (also called an "eductor") where liquid is pumped and air is drawn in. The resulting two-phase effluent (air and liquid) is then ejected into the tank filling it with small bubbles. Defendants' eductor nozzle, illustrated below, normally used to pump two liquids, is of the converging-diverging type with a cylindrical throat portion and a flared end portion.

*Tabular, graphic, or textual material set at this point is not available. Please consult hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

#### **E. The Parties' Contentions Below**

The defendants stipulated that if their device operated within Region I of the '210 patent graph, they would be infringing that patent. As already mentioned, to ascertain the effluent energy rate, the area (A<sub>e</sub>) at the "point of ejection" from the nozzle must be known. However, the parties disagree about the measurement of the exit diameter of the effluent stream from the defendants' nozzle – a critical difference which affects infringement. Because the defendants' nozzle has a flared end, the diameter in the throat is smaller than the diameter at the end of the nozzle. Defendants say that, if the effluent fills up the flared end due to back pressure, then the larger end diameter should be used, and thus their process would fall completely off the '210 patent graph. The flared end is said to be considered "functional" if the effluent fills up the flare, meeting the tank fluid at the end of the nozzle. Under this construction, the "point of ejection" is at the nozzle's end. On the other hand, if the flared end is not functional, as plaintiff says, the throat diameter is to be used because the effluent exits in a column which does not contact the walls of the flared end, and, thus, defendants' machine falls within Region I of the '210 patent graph. Under this latter construction, plaintiff contends that the flared end is merely non-functional and cosmetic, and the "point of ejection" is at the throat.

Defendants also stipulated that their machines included many of the elements of the '706 patent. They contend, however, that neither plaintiff's claimed "hollow tubular expansion chamber member" nor the incorporated '210 nozzles read on their converging-diverging off-the-shelf eductor nozzle.

#### **F. Proceedings Below**

Plaintiff appellant Envirotech sued defendant appellees Monosep for infringement of claims 1, 14 and 15 of the '210 patent and claims 1, 10, 11 and 12 of the '706 patent. Defendants Monosep counterclaimed for a declaratory judgment of invalidity and noninfringement. The action was tried before a judge and a jury from March 7, 1983 through March 11, 1983. The judge gave very general instructions on the law of patents and evidence, and then gave very general special interrogatories, simply asking whether each invention was or was not "novel", "new" <sup>1</sup>"useful", "obvious", whether each patent "distinctly claims the inventions", whether each invention "has been adequately described," and also whether defendants infringed the patents. In answer to these summary interrogatories the jury found the claims at issue in the '210 patent "novel", "new", "not useful" <sup>2</sup>"obvious", "fails" to "particularly point out and distinctly claim the subject matter", <sup>3</sup>"fails" to adequately describe the subject matter, <sup>4</sup>and not infringed. Further, the jury found the claims at issue in the '706 patent "novel", "obvious", and not infringed. Without further comment, the judge adopted the jury's findings and adjudged the claims at issue in the '210 patent invalid under 35 U.S.C. §§101, 103, 112, and not infringed, and the claims at issue in the '706 patent

The plaintiff subsequently made a motion for judgment notwithstanding the verdict and, in the alternative, for new trial based on the lack of substantial evidence to support the jury's verdict. By order, but without any memorandum, the district court denied the motion.

On this appeal, both the issues of validity and infringement are controverted. We consider them in the reverse order.

## II

### *Infringement*

[1][2] In general, a finding of infringement depends on whether the accused device falls within the scope of the asserted claims as properly interpreted. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 770, 218 USPQ 781, 788 (Fed. Cir. 1983). The patented invention as indicated by the language of the claims must first be defined (a question of law), and then the trier must judge whether the claims cover the accused device (a question of fact). See *Fromson v. Advance Offset Plate, Inc.*, 720 F.2d 1565, 1569, 219 USPQ 1137, 1140 (Fed. Cir. 1983); *SSIH Equipment S.A. v. USITC*, 718 F.2d 365, 375, 218 USPQ 678, 688 (Fed. Cir. 1983). The patent owner must show by a preponderance of the evidence that the accused has infringed his patent. *Hughes Aircraft v. United States*, 717 F.2d 1351, 1361, 219 USPQ 473, 480 (Fed. Cir. 1983); *SSIH, supra*; *Chisum, Patents*, 18.06 (1983).

[3] This was a jury case, and the judgment below must be scrutinized by the rules applicable to such jury cases. As the appellate court, we review the jury's findings of fact, (i.e., here that plaintiff failed to meet this burden) in light of the district court judge's denial of plaintiff's JNOV motion. A court cannot merely substitute its view for that of the jury's when reviewing questions of fact. Instead, the guidelines for considering motions for judgment notwithstanding the verdict are: (1) all of the evidence must be considered; (2) in a light most favorable to the non-moving party; (3) drawing all reasonable inferences favorable to that party; (4) without making determinations of credibility of the witnesses. *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1546, 220 USPQ 193, 197 (Fed. Cir. 1983); *Railroad Dynamics, Inc. v. A. Stucki Company*, Appeal Nos. 83-951, 961, slip op. at 11-12, 220 USPQ at 936 (Fed. Cir. January 25, 1984). The judge on a JNOV motion (and this court on review) must ascertain whether there was "substantial evidence of such quality and weight that reasonable and fair-minded men in the exercise of impartial judgment could reasonably return a verdict for the non-moving party". *Wyatt v. Interstate & Ocean Transport Co.*, 623 F.2d 868, 891 (4th Cir. 1980). As this court pointed out in *Connell* and *Railroad Dynamics, supra*, these guidelines are applicable to patent infringement suits. Thus, the precise issue before us on infringement is whether there was substantial evidence to support the jury's factual finding that Envirotech failed to prove infringement by a preponderance of the evidence.

### *The '210 Method Patent*

[4][5] It is elementary that resort must be had in the first instance to the words of the claim which define the metes and bounds of the invention. If the accused matter falls clearly within the terms of the claim, infringement is normally made out. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 607, 85 USPQ 328, 330 (1950); *Smith International, Inc. v. Hughes Tool Company*, 718 F.2d 1573, 1579, fn. 2, 219 USPQ 686, 691 fn. 2 (Fed. Cir. 1983). Said another way, what is patented must first be defined. Words in a claim "will be given their ordinary and accustomed meaning, unless it appears that the inventor used them differently". *Universal Oil Products Co. v. Globe Oil & Refining Co.*, 137 F.2d 3, 6, 54 USPQ 504 (7th Cir. 1943), aff'd, 322 U.S. 471, 61 USPQ 382 (1944).

Representative claim 1 of the '210 patent describes, *inter alia*, "[a] dispersed gas flotation process

wherein \* \* \* the density and the kinetic energy rate \* \* \* per unit volume \* \* \* at the point of ejection \* \* \* (Emphasis added.) The area ("per unit volume") of the effluent discharged from the nozzle is measured at the "point of ejection". The diameter of defendant's nozzle used to measure that area depends upon the question of where the "point of ejection" exists in the diverging section of the nozzle; thus, infringement here depends on this "point of ejection".

Plaintiff appellant argues that the "point of ejection" describes the point where the effluent meets the tank fluid. Defendant appellees argue that ejection occurs at the end of the nozzle. In effect both are saying the same thing. The claim language may be understood, as appellees contend, to define the "point of ejection" as the point where the

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effluent effectively leaves the piece of hardware. However, this does not rule out an interpretation that the "point of ejection" may be at the throat area as Envirotech contends. The flared end of defendant's nozzle may not be functional, and thus the effluent effectively leaves the nozzle at the throat area. We therefore construe the claim to describe the "point of ejection" as the point where the effluent effectively meets the tank liquid.

[6] It was up to the jury to determine whether the defendant's flared end is in fact functional or whether the effluent effectively meets the tank fluid in the throat area of the nozzle. As applied to the evidence, the significance of the latter determination if made, as we have pointed out, would be that defendants' process would fall within Region I of the '210 graph.

Envirotech asserts that the flared end is functional only when there is enough back pressure in the flare to fill up the flared end. To support its contention, Envirotech called as its expert witness, Dr. Bourgoyne, professor and chairman of the petroleum engineering department at Louisiana State University. During his testimony, Dr. Bourgoyne offered a demonstration of a plastic replica of defendants' device in an attempt to show that the effluent ejected in a column never touched the sides of the flared end. Bourgoyne stated that the plastic replica would behave the same as defendants' cast-iron eductor. The entire jury stepped up to observe both the eductor and the fluid flow seen through the plastic.

Defendant called Dr. Muster, professor of mechanical engineering at the University of Houston. He asserted that one cannot tell precisely where the "point of ejection" would be because of changing conditions in a turbulent zone. If anything, he argued, the most sensible "point of ejection" would be where the effluent exited at the end of the nozzle. In addition, defendants read into the record the deposition of Dr. Colbert, one of the patentees, which appears to say that, with a nozzle of defendants' type, the "point of ejection" is at the end of the nozzle.

[7] The jury, faced with a clear conflict in evidence, returned a finding that defendants had not infringed the claims of the '210 patent. This is plainly a factual issue. Based on the testimony of the two experts and the in-court demonstration we have to agree that there was substantial evidence on which the jury could make a finding of non-infringement. Accordingly, we hold that plaintiff failed to prove by a preponderance of the evidence infringement of claims 1, 14 and 15 of the '210 patent.

### *The '706 Apparatus Patent*

Once again we must start with the language of the claims. The element in the claims which is dispositive requires, *inter alia*, a:

"fluid ejection device including: (i) a *hollow tubular expansion chamber* member which has an

open end through which the mixed fluid is ejected into a liquid \* \* \*" (emphasis added)

[8] Thus, the precise issue for literal infringement of the '706 patent is whether defendants' converging-diverging eductor comprises a "hollow tubular expansion chamber member" within the meaning of the claims. The terms of claims are best construed in light of the specification and the circumstances which surround the patent at its inception. *Fromson v. Advance Offset Plate, Inc.*, 720 F.2d 1565, 1569, 219 USPQ 1137, 1140 (Fed. Cir. 1983); *Autogiro Co. v. United States*, 384 F.2d 391, 397, 155 USPQ 697, 702 (Ct. Cl. 1967). Adverting to the specification, appellant argues that the fluid ejection devices (nozzles) claimed in the '210 patent are incorporated by reference into the '706 patent specification, and accordingly the claims read on defendants' devices. Claim 12 of the '210 patent recites a converging-diverging type of nozzle to be used with the process of claim 1 in the '210 patent. Claim 14 of the '210 patent recites an expansion chamber type of device also to be used with the process of claim 1. Those recitations of the '210 patent are part of the '706 patent specification. See *General Electric Co. v. United States*, 572 F.2d 745, 758, 198 USPQ 65, 76 (Ct. Cl. 1978); *In re Schaumann*, 572 F.2d 312, 317 n. 11, 197 USPQ 5, 9 fn. 11 (CCPA 1978); *Velo-Bind, Inc. v. Minn. Mining & Mfg. Co.*, 647 F.2d 965, 968, 211 USPQ 926, 929 (9th Cir. 1981). However, in connection with infringement of the '706 patent, two essential points must be remembered: first, it is still the claims of the '706 patent which must be found infringed; and second, incorporation by reference can only aid in the construction of the '706 claims.

On the basis of the incorporation by reference, appellant argues that its pipe-within-a-pipe configuration which requires a "hollow tubular expansion chamber member" includes the converging-diverging type of nozzle.

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zle. But defendants' expert, Dr. Muster, testified that the Monosep eductor does not have a hollow straight tubular member. Even the throat portion of the eductor, which is straight over a small length relative to the entire nozzle, would not qualify. Not only was the jury aware of Dr. Muster's testimony but there was the in-court demonstration of a purported replica. Although the purpose of the demonstration was to show where the "point of ejection" was within the meaning of the '210 patent, the jury could use the demonstration to ascertain whether there was an expansion chamber within the meaning of the '706 patent. Thus, there was substantial evidence of such quality and weight to support a non-infringement verdict in favor of Monosep. Plaintiff did not meet its burden to prove literal infringement of the '706 patent.

[9] Alternatively, plaintiff alleges infringement under the doctrine of equivalents. This doctrine is usually asserted when actual literal infringement is not present. See *Hughes Aircraft Company v. United States*, 717 F.2d 1351, 1361, 219 USPQ 473, 480 (Fed. Cir. 1983). An accused device may infringe "if it performs substantially the same function in substantially the same way to obtain the same result" as the claimed apparatus. *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 608, 85 USPQ 328, 330 (1950). A finding of equivalence is a determination of fact which may be based on proof by testimony or experts, and should only be disturbed as allowed by the general principles governing appellate review. *Id.* at 609-610, 85 USPQ at 630.

Even if we assume that the '210 claimed nozzles were incorporated by reference into the '706 patent, plaintiff has still failed in its burden to prove infringement by equivalence. The jury had before it both patents and was aware of the incorporation by reference. In addition, the judge gave the correct definition of the doctrine of equivalents to the jury. Testimony by Dr. Muster showed, contrary to appellant's assertions, that it was disputable whether a pipe-within-a-pipe nozzle and converging-diverging nozzle perform the same function in the same way to obtain the same result. Accordingly, we cannot say that there was not substantial evidence on which the jury could base its verdict of non-infringement. The result is that Envirotech failed to prove by a preponderance of the evidence

Monosep's infringement of claims 1, 10, 11 and 12 of the '706 patent.

### III

#### Validity

[10] Our affirmance of the judgment of non-infringement may render academic (for this case) the validity of the '210 and '706 patents. But defendant-appellees have sought a declaratory judgment of invalidity, and may wish to pursue it on the remand which we consider necessary on the issue of validity.<sup>7</sup>

We consider that serious errors vitiated the district court's determination of invalidity. The judge gave erroneous jury instructions which marred the jury's consideration of the factual and legal issues bearing on validity.

[11] For one thing, the judge instructed: "as to information or documents (prior art) which you find from the file wrapper to not have been considered by the examiner and which you find to teach an invention closer to or more like that claimed \* \* \* such presumption (of validity) exists \* \* \*"

This instruction is not proper. The "presumption does not change upon introduction of that art, or at any other time." Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1549, 220 USPQ 193, 200 (Fed. Cir. 1983). See also, American Hoist & Derrick Co. v. Sowa & Sons, Inc., Appeal Nos. 83-555, 83-564, slip op. at 10-16, 220 USPQ 763 (Fed. Cir., January 12, 1984). It is upon the introduction of *more* relevant art that the challenger's burden of persuasion may be *more* easily carried.<sup>8</sup>

[12] The district court also erred in its handling of the utility defense. Defendants

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argued that the alleged critical limitations represented by Region I of the '210 patent graph do not truly delineate the desired operating conditions described in the patent. In addition, they alleged a lack of exact correlation between experimental graphs and the actual patent graph. As we understand them, these defenses are based on the specification's alleged failure to disclose adequately to one ordinarily skilled in the art "how to use" the invention without undue experimentation -- usually considered the "how-to-use" defense under 35 U.S.C. §112. See, Chisum, Patents, 7.03 (1983). However, such assertions have been applied to an argument for lack of utility under 35 U.S.C. §101 when there is a complete absence of data supporting the statements which set forth the desired results of the claimed invention. See, e.g., *In re Ruskin*, 354 F.2d 395, 148 USPQ 221 (CCPA 1966) (specification devoid of any quantitative data). The trial judge did nothing to dispel any confusion between §101 and §112. He even added to the problem by first allowing defendants' last amendment of the pleadings to include a lack of utility defense, <sup>9</sup> and then merely quoting from §101 in his charge. Even if defendants' argument of inadequate experimentation or inexact correlation were to apply, the fact that an invention has only limited utility and is only operable in certain applications is not grounds for finding lack of utility. *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 958-59, 220 USPQ 592, 598 (Fed. Cir. 1983); *Carpet Seaming Tape Licensing Corp. v. Best Seam, Inc.*, 694 F.2d 570, 578, 216 USPQ 873, 880 (9th Cir. 1982). Some degree of utility is sufficient for patentability. *E. I. duPont de Nemours & Co. v. Berkley and Co.*, 620 F.2d 1247, 1260, fn.17, 205 USPQ 1, 10 (8th Cir. 1980). Further, the defense of non-utility cannot be sustained without proof of total incapacity. *Id.*

Perhaps the most glaring defect arises from the defective charge on the issue of obviousness. In his instructions to the jury the judge did not set forth the trilogy of factual inquiries outlined in *Graham v. John Deere Co.*, 38 U.S. 1, 148 USPQ 459 (1966): (1) the scope and content of the prior art; (2) the

differences between the prior art and the claims at issue; and (3) the level of ordinary skill in the art. Nor was the jury called upon to answer special interrogatories on these inquiries, or to give special verdicts thereupon.

[13] Submission of the obviousness question to the jury should preferably be accompanied by specified interrogatories designed to elicit responses to all the factual inquiries enumerated in Graham. Proper instructions based on those inquiries should always be given.<sup>10</sup> See Connell, *supra*, 722 F.2d at 1547, 220 USPQ at 197; *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, *supra*, slip op. at pp. 18-19, 220 USPQ at 771; *Railroad Dynamics, Inc. v. A. Stucki Company*, *supra*, slip op. at 17 ff, 220 USPQ at 938. In the absence of such special findings and of a proper charge on which a conclusion of obviousness can be reviewed, and because the parties here are not yet in substantial agreement as to facts bearing on the obviousness issue, it is appropriate to remand the present case.

[14] Accordingly, in light of the above errors, we cannot affirm the lower court's denial of Envirotech's JNOV motion regarding invalidity. "(This) court must be satisfied \* \* \* that the party challenging validity has [properly] carried its burden of overcoming the presumption (of validity)." *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 721 F.2d 1563, 1567, 220 USPQ 97, 100 (Fed. Cir. 1983). We are not satisfied. As a court never "declares" a patent valid, we merely vacate and remand on the issue of validity. We leave initially to the district court the extent to which a new trial is required if the issue of patent invalidity is pursued.<sup>11</sup> However, if the parties can stipulate all the relevant facts, the judge can decide for himself the legal issues relating to validity. See *White v. Jeffrey Mining Machinery Co.*, 723 F.2d 1553, 220 USPQ 703 (Fed. Cir. 1983).

### Conclusion

We affirm the judgment that the inventions set forth in claims 1, 14 and 15 of the '210 patent, and in claims 1, 10, 11 and 12 of the '706 patent are not infringed; we vacate and

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remand on the issue of the validity of these claims. Each side will bear its own costs in this court.

Affirmed in Part, Vacated and Remanded in Part.

### Footnotes

Footnote 1. We are unsure what "new" was intended to mean, as distinguished from "novel".

Footnote 2. On the last day of trial, defendants were granted their motion to amend the pleadings to add the defense of lack of utility. The defense seems to be one of inoperability of the '210 patent graph for failing to set forth critical limitations as a result of a lack of exact correlation between the patentee's experimental data and the actual graph in the patent.

Footnote 3. This latter defense – enablement – is based on alleged ambiguity of the claimed "point of ejection".

Footnote 4. This latter defense -- definiteness -- is based on alleged ambiguity of the claimed "point of ejection".

Footnote 5. Defendants attacked the value of the demonstration on the lack of "threads" at the end of the nozzle. Dr. Bourgoyne subsequently held the same demonstration with threads cut into the flared end – akin to defendants' nozzle.

Footnote 6. The expansion chamber is where the gas mixes with the liquid before being discharged as a two-phase effluent.

Footnote 7. If defendants do seek to continue with their claim of invalidity, the court below and the parties will have to face the problems whether a constitutional "case or controversy" still exists between the present parties, and if it does whether it is appropriate to issue a declaratory judgment in this case. We intmate no opinion on either of these questions.

Footnote 8. The most relevant prior art defendants offered were U.S. Patent No. 2,938,629 to Hollingsworth entitled "Concentration of Comminuted Materials", and U.S. Patent No. 3,446,353 to Davis entitled "Method and Apparatus for Froth Flotation". Although these patents were primarily offered at trial to show invalidity of the '706 patent, their relationship to the '210 patent was also discussed. The Hollingsworth patent which also addresses flotation devices, suggests the advantage of multiple nozzles in each tank. (Column 3, lines 25-29.) At trial, and then in their closing argument, defendants pointed toward language which they contend suggest single nozzle operation. (Column 6, lines 65-71 and Column 9, lines 66-71, respectively.) The Davis patent points out the effect power (kinetic energy rate) and tank volume have on bubble distribution and the tank surface.

Footnote 9. We do not, at this time, pass on whether the amendment was properly allowed.

Footnote 10. Interrogatory No. 2 pertaining to obviousness read: "Do you find that the defendants have proved by clear and convincing evidence that the differences between the patent claims and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains?" Answer: "Was obvious". That 'interrogatory' appears to be an inapt instruction and the jury's answer a type of special verdict on the issue of obviousness.

Footnote 11. If a new jury trial including obviousness is had, it would be preferable to submit at least detailed special interrogatories as to the facts enumerated in *Graham v. John Deere*, *supra*. See *Connell v. Sears, Roebuck & Co.*, *supra*; *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, *supra*.

### Concurring Opinion Text

#### Concur By:

Baldwin, Circuit Judge, specially concurring.

I only wish to clarify that in this case the claims at issue were submitted to the jury with proper instructions. The jury in its deliberations construed the claims in accordance with those instructions and then determined there was no infringement.

Further, regarding the '210 patent, we have not construed claim 1 *de novo* in this appeal. We are presuming this particular construction as it is consistent with the jury verdict and it is supported by substantial evidence.

- End of Case -